

METHOD AND APPARATUS FOR CUTTING ELASTOMERIC MATERIALS
AND THE ARTICLE MADE BY THE METHOD

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THIS APPLICATION IS A DIVISIONAL OF APPLICATION SERIAL NO. 09/871,766.

Technical Field

[0001] This invention relates to methods and apparatus for cutting elastomeric materials at low skive angles, in particular cutting layered composites of elastomeric materials including layers containing reinforcing materials.

Background of the Invention

[0002] Various methods and apparatus have been used for the cutting of sheets of elastomeric material. Such elastomeric material might consist of single sheets of the homogeneous material, or multiple layered sheets of materials having properties that are different from one another. In the case of multiple layered sheets of elastomeric material that, for various reasons, need to be cut, one or more of the layers might contain reinforcing cords or fibers made of metal or fabric. Such reinforcing cords or fibers might be simply aligned in such a way as to be parallel to one another. Furthermore, the elastomeric materials that are to be cut may or may not be cured or vulcanized at the time of cutting.

[0003] Prior art cutting methods and apparatus include cutting wheels, ultrasonic cutters, guillotine knives, wire cutters and vibrating scroll cutters whose active cutting principle is a saw blade or a blade or a tensioned wire.

[0004] While such prior art cutting methods are effective to varying degrees, each has disadvantages. For example, the guillotine knife is somewhat effective in cutting composite elastomeric materials, but it has the disadvantage of having a tendency to deform the cut surfaces of the elastomeric material as the knife penetrates the material. Such deformation of the cut edge increases the difficulty of subsequent splicing the ends of the elastomeric material. Moreover, the guillotine knife produces a continually degraded cut surface as the blade becomes dull and as small pieces of elastomer began to build up on the blade. Yet another disadvantage was the inability of the blade to cut at an angle less than 30 degrees relative to the plane of the material being cut. The guillotine blade also tends to generate heat during the cutting process such that, as numerous cuts are made, the temperature of the knife becomes sufficiently elevated in